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Does Lockdown During COVID-19 Pandemic Destabilize Bipolar Patients? A Prospective Study

Lockdown period: stress and mood in bipolar disorder

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Lockdown period: stress and mood in bipolar disorder

ABSTRACT

Objectives. Emergent literature reports that confirmed or suspected cases of COVID-19 can lead to severe psychological stress. However, a small but growing number of studies have consistently suggested that individuals exhibit significant coping capability facing the pandemic. The main objective of this study was to describe the effects of the pandemic, during and after the lockdown periods, on mood, anxiety and chronobiological rhythms in a cohort of bipolar patients.

Material and methods. We conducted a prospective and descriptive study on patients with a DSM- 5 diagnosis of bipolar I disorder or bipolar II disorder and evaluated the Perceived Stress Scale (a 10-item self-administered questionnaire) at two times: 1) during the period of the French first lockdown (N = 159 patients); and 2) from one week to six weeks after the lockdown period (N = 94 patients). Our primary objective was composite and focused on the mood levels and the perceived stress during these two periods.

Results. This study shows that the mood is stable, and perceived stress scores decrease between the lockdown and the post-lockdown periods. Moreover, regarding the patient's living space, we found a significant (positive) correlation between the number of rooms and the mood, as well as a significant influence on the mood by the number of residents living with the patient during the lockdown.

Conclusion. These results suggest that our cohort of bipolar patients could have good coping abilities under extraordinary stressful situations. In the future, it could be relevant to monitor the long-term potential impact of such stress.

KEYWORDS

COVID-19; bipolar disorder; stress; mood; coping; vulnerability.

1. Introduction

The COVID-19 virus outbreak spread worldwide rapidly in late January 2020 and aroused enormous attention globally [1]. The COVID-19 pandemic has caused a parallel epidemic of fear, anxiety and depression [2]. Flaxman and colleagues have predicted that, across 11 countries, between 12 and 15 million individuals have been infected with SARS-CoV-2 and that lockdown has had a large effect on reducing transmission [3]. Lockdown measures would have prevented, across six countries, about 530 million confirmed cases of infection [4].

Emergent literature reports that, apart from physical suffering, it is not uncommon for confirmed or suspected patients with COVID-19 to suffer from severe psychological disturbances [5]. Confirmed and suspected cases of COVID-19 may experience two types of psychic consequences. The first type is related to the fear of severe disease consequences [6]. As a result, they may experience depression, insomnia, and despair, or even suicidal thoughts. We could notice that some suspected isolated cases may suffer from anxiety due to uncertainty about their health status and develop obsessive-compulsive symptoms. The second type of repercussion is related to the strict lockdown and restrictive public health policies, such as physical distancing measures, which could cause loneliness, societal rejection, financial loss, discrimination, and stigmatization [7]. The limited knowledge about COVID-19 and the overwhelming news may lead to anxiety, disappointment, fear, irritability or boredom under the isolation measures [8]. Therefore, loss of access to mental health support, alongside with loss of positive activities, might increase vulnerability during COVID-19 lockdown. We could also include suicide and self-harm, alcohol and substance abuse, gambling, domestic and child abuse, risk of post-traumatic stress disorder and psychosocial risks such as social disconnection, entrapment, cyberbullying, bereavement, unemployment, homelessness, and relationship breakdown.

However, a small but growing number of studies have consistently suggested that individuals exhibit significant coping facing the pandemic [9–12]. More specifically, the Center for Disease Control has published several guidelines for coping with the pandemic [13]. In this case, individuals could uncover inner resources and quickly learn to draw on external resources [11].

We propose to carry out a study on a particularly vulnerable population, characterized by mood and anxiety symptoms and chronobiological disturbances, such as patients with type I or type II bipolar disorder. In the current pandemic context, it can be particularly useful for the clinician to anticipate if and to what extent the stress related to a major event, such as COVID-19 and lockdown, will overcome adaptive capabilities and result in mood relapses.

Based on the hypothesis that adequately treated bipolar patients are able to mobilize appropriate coping resources when faced with an extraordinary stress factor, our main objective was to describe the effects of the pandemic, during and after the lockdown, on mood, perceived stress and chronobiological rhythms in a cohort of bipolar patients. Our secondary objective was to compare the stress level before and after the lockdown, respectively the mood state before and after the lockdown. These comparisons were weighted by environmental factors such as the habitat characteristics: living space (number of rooms) and people living with the patient during the lockdown – which may modulate the stress perception, as well as treatment characteristics and potential substance or medication use to calm potential anxiety.

2. Methods

In this prospective, descriptive (primary objective) and comparative paired study (secondary objective), patients with a DSM- 5 diagnosis of bipolar I disorder or bipolar II disorder were recruited from the Center of Expertise for Bipolar Disorders at the Grenoble-Alpes University Hospital in France. Patients provided informed consent and they anonymously answered a questionnaire. Participants were assessed extensively for their socio- demographic and clinical features (including age, gender and profession). The responses were investigated with:

- The Perceived Stress Scale (PSS), a 10-item self-questionnaire rated on a Likert scale of 0 to 4 and assessing the importance with which life situations are perceived as threatening, i.e. unpredictable, uncontrollable and distressing [14]. Three theoretical thresholds are validated for the PSS: "< 21", "Between 21 and 26" and "> 27".
- A short self-reported analogue mood scale, rated on a Likert scale of 1 to 10, with 5 for euthymia, less than 5 for a tendency to sadness and greater than 5 for a tendency for hyperthymia, according to Preskorn et al. [15,16].
- A short self-reported analogue mood evolution scale, rated on a Likert scale of 1 to 3, patients describing the stability of their mood over the previous 6 weeks, rated on three levels ("not stable at all", "partially stable" or "completely stable"). Thus, this scale considers both sadness and hyperthymia related change.
- A short self-reported sleep questionnaire was used to assess sleep, according to the dimensions described in the International Classification of Sleep Disorders, third edition (ICSD-3): sleep time, sleep satisfaction and the three types of insomnia (initiating insomnia, maintaining insomnia, early insomnia). The patient was asked about his or her sleep over the past month.

These measurements were collected twice: 1) during the period of the French lockdown (March 17, 2020 – May 11, 2020); and 2) from one week after exiting the lockdown and up to a period of 6 weeks after (up to June 22, 2020). Given the conditions of the lockdown, the patients were contacted remotely and were not seen in consultation specifically for rating these scales. The data was entered in a spreadsheet, anonymously, for statistical processing in a single blind manner. Such a methodology necessarily constrained access to the personal clinical data of patients (anonymization of study responses with no match to the patients' history of disease).

Our primary objective was to describe the effects of the lockdown period and of the period after lockdown on the mood levels (self-reported analogue scale between 1 and 10, with 5 for euthymia, less than 5 for sadness and greater than 5 for hyperthymia), the evolution of mood levels over the previous 6 weeks (self-reported scale with three levels : not at all – partially – completely), and the perceived stress (according to a theoretical threshold validated within the PSS – score < 21: able to manage stress and adapt; score between 21 and 26: generally knows how to cope with stress, but feels helpless; score > 27: perpetual threats and a strong feeling of helplessness), on the same patient population assessed before and after the lockdown.

Our secondary objective was to perform group comparisons, between the lockdown period and the post-lockdown period, on the stress and mood variables (Student's t-test – multivariate linear regressions on mood and stress are given in Supplementary Materials). Specifically, we provide outcomes depending on factors such as the habitat characteristics (number of rooms or people living with the patient during the lockdown). We also asked whether the patient was taking any medication or relevant substance. In addition, specific details are given on sleep time, sleep satisfaction and insomnia, data particularly important in bipolar disorder vulnerability. We performed these analyses on the same patient population, assessed before and after the lockdown.

The assessment protocol was approved by the relevant ethical review board (CPP-Ile-de France V, July 2029). These analyses were carried out with the anonymity of patients, a condition required by the Ethics Committee (CERGA) to “allow the free expression of patients”. All analyses were performed with the R software (4.0.3).

3. Results

3.1. Data collection

In regard to the primary objective, responses of 159 patients with bipolar disorder were collected during the lockdown period, and responses of 94 patients were collected during the post-lockdown.

In regard to the secondary objective, among all these patients, we were able to find 58 patients who had participated in the study both during the lockdown and after the lockdown (identification made with anonymity), therefore having the same clinical characteristics.

3.2 Primary objective: descriptive analysis

Descriptive measures for each group (during and after the lockdown) are provided in the two columns of **Table 1**. The groups are globally comparable on the different socio-demographic data (except for work at the workplace). This table provides information on the descriptive variables for each group and should not lead to a statistical comparison, given that few patients (N = 58) were present in each of these groups. Note that the methodology of the study was not designed to reveal the potential relapse in patients with bipolar disorder which, as we will see in the Discussion, could limit the generalization of the study.

[INSERT TABLE 1]

Table 2 shows that mood is globally stable, mostly euthymic (mean of 5.05 on a 10-point Likert scale) and that the mood evolution is rather limited (mean of 1.93 points). Regarding the perceived stress, we found that 47.8% of patients presented a high score on the PSS (> 26 / 47) during the lockdown, reflecting perpetual threats and strong helplessness feelings.

After the lockdown, we found a decrease in the high perceived stress rates (from 47.8% during the lockdown to 38.3% after the lockdown).

[INSERT TABLE 2]

Specific details are provided on sleep time, sleep satisfaction and the three types of insomnia described in the ICSD-3, data on sleep being particularly important in bipolar disorder [17,18], even if stabilized [19]. **Figure 1** shows that, for a large part of the patients, sleep time and sleep satisfaction were similar during and after the lockdown compared to their usual sleep time and sleep satisfaction (gray areas on panel A.). Interpretation of these results should be compared with the literature on sleep in bipolar patients, where sleep is known to be usually unsatisfactory [20]. However, by informally comparing sleep time and sleep satisfaction in our cohort before and after the lockdown, these two measurements are diminished/reduced/smaller after the lockdown.

[INSERT FIGURE 1]

3.3. Secondary objective: statistical comparisons between lockdown and post-lockdown periods

It can be particularly useful for clinicians to obtain information about the difference between stress and mood levels during lockdown and after lockdown. **Table 3** shows no statistically significant difference in the mood ($p = 0.74$), mood evolution ($p = 0.16$) and perceived stress ($p = 0.29$) between the period during the lockdown and the period after the lockdown, on the 58 patients who responded before and after the lockdown.

Regarding the environment elements of the that can influence the mood, analyses were carried out on the descriptive parameters cited in Table 1. Findings show no significant influence on the mood by the number of rooms in the patient's accommodation during the lockdown ($p = 0.05$; $M = 0.35$; CI = [-0.004 – 0.70]). Regarding the number of rooms in the patient's accommodation after the lockdown, we found a significant correlation between the number of rooms and the mood ($p < 0.001$; $M = 0.53$; CI = [0.26 – 0.81]). We found a significant influence on the mood by the number of residents living with the patient during the lockdown ($p = 0.028$; $M = 0.47$; CI = [0.05 – 0.90]), and no relationship between mood and the number of persons living with the patient post-lockdown ($p = 0.66$; $M = 0.033$; CI = [-0.12 – 0.19]). Regarding the relationship between mood and substance use to calm anxiety, we found no significant correlation during lockdown ($p = - 0.05$; $M = 0.05$; CI = [-2.27 – 0.02]) and after the lockdown ($p = 0.69$; $M = - 0.20$; CI = [-1.25 – 0.83]). Likewise, there was no difference in terms of self-medication (i.e. anxiolytic, hypnotic or antidepressant medications) on mood during the lockdown ($p = 0.24$; $M = - 0.77$; CI = [-1.87 – 0.47]) or after the lockdown ($p = 0.65$; $M = - 0.22$; CI = [-1.2 – 0.75]). All the results are given in **Table 3**.

[INSERT TABLE 3]

Lastly, **Figure 2** shows the absence of a statistically significant difference between the two PSS questionnaires (during and after the lockdown), for each of the 10 questions (panel A, radar plot). The distribution of the PSS results is given in panel B of **Figure 2**. These plots show that the perceived stress distributions are mostly overlapping.

[INSERT FIGURE 2]

In the Supplementary Materials we provide the results of the correlation between these different variables of lifestyle, drug and substance intake and sleep, and we verified, with a network analysis, that the main stress study tool (PSS) had a good intrinsic validity across our sample. We performed multivariate analyses, given in the legend of **Supplementary eTable 1**. Adjustment variables correspond to stress, mood and mood evolution.

We have been able to confirm that mood and perceived stress (**Supplementary eFigure 1**) are strongly corelated, both during and after the lockdown (**Supplementary eTable 1**), correlation that is widely demonstrated - even in the absence of any pandemic - in people with bipolar disorder [21]. Network analyses also confirm that the PSS tool has good internal validity in our sample (**Supplementary eFigure 2** and **Supplementary eFigure 3**).

4. Discussion

The purpose of this descriptive (primary objective) and comparative (secondary objective) study was to highlight the impacts of COVID-19, and particularly of the lockdown and post-lockdown periods, on the mood and perceived stress of patients with bipolar disorder. To our knowledge, this was the first time that the effect of COVID-19 was specifically studied on a cohort of bipolar patients.

The perceived stress scores are particularly high during the lockdown. In this sample, almost half of the patients have a high score (above 26/47). We did not find any statistically difference, for the perceived stress, between the lockdown and the post-lockdown results, comparison carried out on 58 patients. A score above 26 on this scale signifies "a perpetual threat to the person", who would have the feeling of being subjected to most situations and to be able to do nothing but to endure them, with an overwhelming feeling of impotence and a high vulnerability for relapse. Such a high score should be considered when a new lockdown occurs and could be an interesting marker of the sensitivity to external destabilizing factors in bipolar disorder, requiring additional studies on a larger clinical population.

Faced with the reality of the COVID-19 pandemic and the constraints related to lockdown, we hypothesize that the absence of increased or decreased mood dysregulations are mainly related to good coping abilities in patients with bipolar disorder. This coping is not measured directly [22–24], but rather mirrored by the absence of destabilization in mood, sleep and perceived stress. Our results are consistent with a growing literature on mood coping in the general population, population which is able to adjust to the "drastic developments and changes due to the COVID-19 pandemic in the short term" [25–27], or even demonstrates a decrease in a proxy such as self-harm [28] or suicide [29] in the general population during the pandemic. Other studies have not found increased psychotic experiences [30] or depressive, anxiety, and obsessive-compulsive disorders [31]. Individuals with such symptoms or disorders could experience a detrimental impact on their mental health from the COVID-19 pandemic, that might escape close monitoring in clinical practice. But the COVID-19 pandemic does not seem to have further increased symptom severity compared with their prepandemic levels.

These results are also consistent with the literature on the impact of an external event (like an infection or a lockdown) on patients with a bipolar or psychiatric disorder [1,32]. We may speculate that the presence of a common threat (such as a pandemic, war, etc.) fosters more cooperation between individuals compared to a particular individual stressor (such as a personal life event), while

the latter may have more influence in terms of thymic dysregulation. We also confirm the hypotheses found in the literature, according to which the entourage of patients is particularly important with regard to mood and mood stability [33]. Another hypothesis that may explain why thymic dysregulation and perceived stress are not as high as expected, is that the patients had a decrease in stress related to social interactions during the lockdown. More precisely, we found, in an intuitive way, that the mood may be impacted by the number of persons living with the patient during the lockdown, reinforcing the hypothesis regarding the importance of social bonds in ensuring the mood stability [34,35]. Thus, these results reinforce the hypotheses promoted in the literature, according to which the social connections ensuring mood stability correspond to relations with people close to the patient (e.g. living in the same home), but that a large number of social confrontations and an immersion in social competition may potentially risk destabilizing the patient's condition [36]. Lastly, interestingly, both during the lockdown and post-lockdown, there was no increase in substance use or in anxiolytic self-medication, despite some literature documenting/stating that relapses in bipolar disorders are associated with higher susceptibility to substance use [37]. This result can be explained by the fact that the patients did not indeed present any mood decompensation in our study, and thus did not need to use more substances or medication. It may also shed a light on a certain vagueness in the literature when it comes to substance abuse in bipolar disorder: in the presence of an external stressor, as is the case in our study, this consumption would not necessarily increase in the absence of relapse [37,38].

Such results, attesting to a potential resilience, should not lead to a reduction in the intensity of care, but rather to a continuation of the decisions and interventions initiated according to international treatment guidelines. Particularly, it seems necessary to continue supporting the self-management strategies, to examine the contribution of digital technologies and to strengthen interdisciplinarity with the aim of improving the care and rehabilitation pathways for bipolar patients. Therefore, in this time of crisis, the research priorities in terms of primary prevention (“avoid development of complications in the population of bipolar disorder”) and secondary prevention (“avoid worsening of the existing difficulties”) should definitely be continued.

This study had several limitations. The first main limitation results from the lack of knowledge on the psychometric properties of the analog evaluations specifically used, i.e. the two brief self-reported analog mood scales (a 10-point mood scale and a 3-point mood evolution scale). The mood scale has already been used to monitor the course of the patient's illness, particularly in developing a better understanding of her or his illness and identifying predictive outcome factors [15,16]. Paired group correlation analyses seem difficult to interpret, because scores toward the extremes, at both ends of the scale (reflecting sadness *versus* mania), would both be considered more pathological.

The second main limitation is that, despite the multiple linear regression carried out to correct the potential confounding factors, we were only able to compare 58 patients with themselves during these two time periods. The fact that only 58 patients participated in the study during the two periods leads to two issues. The first issue is that the small number of subjects limits the extrapolation of our results. However, the large number of participants (N = 159 during the lockdown and N = 94 during post-lockdown), which corresponds to most of our monocentric active file population, is a strength of this study in terms of generalization.

The third main limitation is due to the fact that we are not aware of the opinions of other patients not included in the study, which may limit the possibility of generalizing to the entire population of bipolar patients. In particular, it could be that patients whose mood and stress have deteriorated are precisely those who did not respond during the post-lockdown. However, this limitation is counterbalanced by the fact that we had, especially for the 159 participants during the lockdown, a large majority of the patients followed within our regional center of expertise.

On short term, adequately treated bipolar patients, followed-up in a reference center, may have good coping abilities in terms of mood regulation under extraordinary stressful situations. It could be relevant to monitor, over the long term, the potential impact of such an extraordinary stress, related to the pandemic and conditions required to control it, like lockdown. Such an increased perceived stress in patients with bipolar disorder could have a subsequent impact on the care strategies.

Conflict of interest

All the authors declare none.

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Captions for Figures

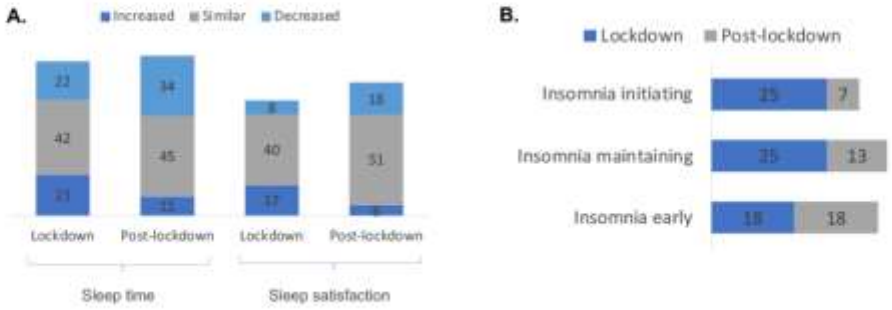

Figure 1.

Figure 1. A. Percentages of sleep time relative to usual sleep time (two bars on the left) during the lockdown *versus* after the lockdown, respectively: 22% versus 34% are decreased, 42% versus 45% are similar, and 23% versus 11% are increased; percentages of sleep satisfaction relative to usual sleep satisfaction (two bars on the right) during the lockdown and after the lockdown, respectively: 8% versus 18% are decreased, 40% versus 51% are similar, and 17% versus 6% are increased. **B**. Percentages of insomnia initiating, insomnia maintaining and early insomnia during (blue) and after (gray) the lockdown. Insomnia seems more severe during the lockdown (with 25% for Insomnia initiating and Insomnia maintaining, and 18% for Insomnia early) compared to the post-lockdown period (with 7% for Insomnia initiating, 13% for Insomnia maintaining, and 18% for Insomnia early).

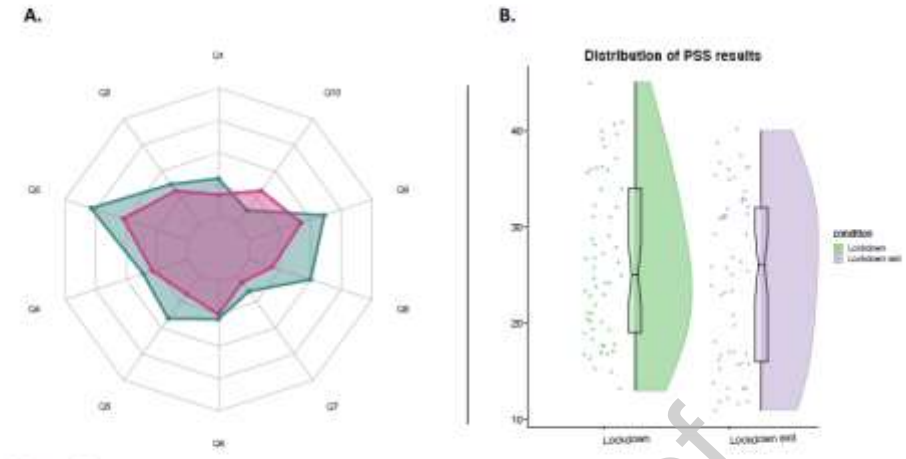

Figure 2.

Figure 2. **A**. Radar plot of the sum of the 10 questions of the PSS. Dark green: PSS during lockdown; Pink: PSS in post-lockdown. **B**. Raincloud plot showing the distribution of the PSS results during lockdown and in post-lockdown.

Title for Tables

Table 1. Descriptive characteristics of the patients, during and after the lockdown.

Table 2. Mood, mood evolution (on a 6 week-period) and perceived stress during and after the lockdown.

Table 3. Comparative analyses between the lockdown and the post-lockdown periods.

Table 1.

	Lockdown (N = 159)	**Post-lockdown** (N = 94)
Mean Age	48.5	48.01
Married / In a relationship / Single	52.1% / 22.4% / 25.5%	49.3% / 27.7% / 23%
Female / Male / Non-binary	62.3% / 37.1% / 0.6%	66% / 32.9% / 1.1%
Professions: **Unemployed and retired / Higher intellectual professions and intermediate professions / Commercial professions and employees / Students**	21% / 24% / 40% / 15%	14% / 21% / 48% / 17%
Work: Teleworking / Working at the workplace / At home and not working / Not specified	28.9% / 10.7% / 40.9% / 19.5%	21.3% / 35% / 26% / 17.7%

Living place: Apartment (versus other, e.g. house) / Outdoor place (balcony, terrace or garden)	45.9% / 54.1%	52.1% / 47.9%
Four rooms or less	36.7%	40.4%
Yard availability	46%	45%
Living with three people or less	86.4%	90.8%

We notice that no participant had declared to have been contaminated by COVID-19 or lived with someone who contracted it.

Table 2.

	Lockdown sample (N = 159)	**Post-Lockdown sample** (N = 94)
Mood	Mean: 5.05; SD: 1.81	Mean: 5.16; SD: 1.68
Mood evolution	Not at all: 29 Partially: 52 Completely: 18 Mean: 1.93; SD: 0.72	Not at all: 35 Partially: 43 Completely: 21 Mean: 2.17; SD: 1.12
Perceived stress (PSS)	Score between 11 and 20 N = 48 Mean= 16.31 Median: 17 Percentage of the sample: 30.18%	Score between 11 and 20 N = 34 Mean: 14.73 Median: 14 Percentage of the sample: 36.17%
	Score between 21 and 26 N = 33 Mean: 23.48 Median: 23 Percentage of the sample: 20.75%	Score between 21 and 26 N = 21 Mean: 23.00 Median: 23 Percentage of the sample: 22.34%
	Score between 26 and 47 **N = 76** Mean: 34.37 Median:33 Percentage of the sample: 47.80%*	Score between 26 and 47 **N = 36** Mean 32.67 Median: 33 Percentage of the sample: 38.30%**

PSS: Perceived Stress Scale

SD: Standard Deviation

*2/159 patients did not respond.

**3/94 patients did not respond.

Table 3.

	Variables	Lockdown	Post-lockdown
Comparisons (t-test)	Mood	t = -0.3 [-0.75 to 0.54] p = 0.74	
	Mood evolution over previous 6 week-period	t = -1.38 [-0.60 to 0.10] p = 0.16	
	PSS (sum)	t = 1.07 [-1.44 to 4.81] p = 0.29[1]	
Linear regressions (parameter / Confidence interval / p value)	Mood depending on the number of rooms	0.35 [-0.004 – 0.70] p = 0.05	0.53 [0.26 – 0.81] p < 0.001***
	Mood depending on the number of persons living with the patient	0.47 [0.05 – 0.90] p = 0.028*	0.033 [-0.12 – 0.19] p = 0.66
	Mood depending on substance abuse	- 0.05 [-2.27 – 0.02] p = 0.05	- 0.20 [-1.25 – 0.83] p = 0.69
	Mood depending on self-medication	- 0.77 [-1.87 – 0.47] p = 0.24	- 0.22 [-1.2 – 0.75] p = 0.65

'***' = p < 0.001; '**' = p < 0.01; '*' = p < 0.05. [1]: There were no differences between the three levels of perceived stress, with (for lockdown and post-lockdown respectively) N=18 *versus* N=21 for low level, N=13 *versus* N=10 for medium stress and N=26 *versus* N=26 for high level of perceived stress. The table gives the value for the mean of the difference (coefficient), the confidence interval in brackets and the p-value with its potential significance.